UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
TANG, KUO LIANG J

ART UNIT	PAPER NUMBER
2122	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/710,948	KRISHNA ET AL.
	Examiner	Art Unit
	Kuo-Liang J Tang	2122

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-18,20-26 and 28-39* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-18,20-26 and 28-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the amendment filed on 11/04/2003.

1.   Claims 1-2, 14-15 and 27-28 remain rejected under 35 U.S.C. 103(a) (note claims

1, 14 and 27 are amended to correct minor informalities, and the amendment does not

change the scope of these claims. Therefore, the same rejections set forth in the rejections

in paper no. 8 also applies to the amended claims 1, 14 and 27).

2.   Claims 3, 16 and 29 remain rejected under 35 U.S.C. 103(a) (note claim 3, 16 and

29 are amended to correct minor informalities, and the amendment does not change the

scope of these claims. Therefore, the same rejections set forth in the rejections in paper

no. 8 also applies to the amended claim 4).

3.   Claims 4, 17 and 30 remain rejected under 35 U.S.C. 103(a).

4.   Claims 5, 9-13, 18, 22-26, 31 and 35-39 remain rejected under 35 U.S.C. 103(a).

5.   Claims 7-8, 20-21 and 33-34 remain rejected under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 1, 2, 14-15 and 27-28 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Rosenberg, Jonathan B., "How Debuggers Work: algorithm, data

structure, and architecture", chapter 6 & 8, pp105-133, 151-172; John Willy & Sons, Inc.,

1996 (hereinafter Rosenberg), in view of Sumi et al. (US Patent No 5,881,288)

(hereinafter Sumi).

      Per Claim 1, Rosenberg disclosed

"receiving a file name for an executable image file, (see page 167, line 4,

executable file) wherein the executable image file is loaded in memory of a computer

system and the global breakpoint is to be placed in the image for executing by the

computer system;" (see page 110 , Algorithm 6.1 **Breakpoint** setting, "Input **File name**

and line number or file **offset** in source file").

      "receiving a symbol expression for a location in the executable image file where

the global breakpoint is to be placed;" (see page 161-172, symbol tables and expression,

e.g. Figure 8.1)

      "passing the symbol expression and the file name to a first operating system

module running on the computer system;" (E.g. see Page 161-172, and Algorithm 8.2-

8.7)

      "receiving a file offset corresponding to the symbol location from the first

operating system module;" (E.g. see Page 161-172, and Algorithm 8.2-8.7)

      "passing the file name for the executable image file to a second operating system

module;" (E.g. see Page 161-172, and Algorithm 8.2-8.7)

      "receiving a file identifier from the second operating system module, wherein the

file identifier is used by the operating system for uniquely identifying the file in the

computer system memory;" (E.g. see Page 161-172, and Algorithm 8.2-8.7) and

"representing said global breakpoint in code of said software using the received file identifier of the executable image file and the received offset in said file"(see page 110 , Algorithm 6.1 **Breakpoint** setting, "Input **File name** and line number or file **offset** in source file" and Page 161-172, Algorithm 8.1-8.7).

Rosenberg teaches executable image file (see Page 167, line 4) loaded in the memory of computer system. Since it is a file, a file name is inherently possessed. Also in the operating system, every file is unique. And it is easy to lookup a symbol expression and/or offset for a location in the executable image file by looking up the symbol tables of the file. (Page 161-172, and Algorithm 8.2-8.7).

Rosenberg does not disclose setting a breakpoint in the executable file. However, Sumi teached setting a breakpoint in the executable file. (see Column 19, Lines 11-15, "The **breakpoint** setting unit 203 receives a breakpoint indication from the user which is made in line units, converts the indicated breakpoint into an address in the execution code, and sets a breakpoint at the converted address in the **execution code**."). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set a breakpoint in an executable code, as suggested by Sumi, to use as a breakpoint indication. The modification would have been obvious because one of ordinary skill in the art would have been motivated to add flexibility of breakpoint setting.

Per Claim 2, Rosenberg disclosed

-file identifier is a file name. (see page 110 , Algorithm 6.1 Breakpoint setting, "Input **File name** and line number or file offset in source file").

Claim 14 is the computer implemented claim corresponding to the method claim 1

and is rejected under the same reason set forth in connection of the rejection of claim 1.

Further Sumi disclosed **a central processing unit for executing said computer**

software and memory for storing at least a portion of said computer software. (see

Column 1, Lines 62-67, "The debugging apparatus shown in FIG. 1 is made up of a

program storage unit 301, a generated code storage unit 302, an optimization

information storage unit 303, a **debugging information storage unit** 304, an input unit

401, a **code execution unit** 402, a variable operation unit 403, an output unit 404, and a

line display unit 405.").

Claim 15 is rejected under the same reason set forth in connection of the rejection

of claim 2.

Claim 27 is the computer program product claim corresponding to the method

claim 14 and is rejected under the same reason set forth in connection of the rejection of

claim 14.

Claim 28 is rejected under the same reason set forth in connection of the rejection

of claim 2.

8.   Claims 3, 16 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Rosenberg in view of Sumi as applied in claim 1, 14 and 27 respectively, in further

view of O'Connor (US Patent No 6,584,582).

        Per Claim 3, Rosenberg disclosed file identifier is a file name. Neither Sumi nor

Rosenberg disclosed inode. However, O'Connor teached inode. (see Column 4, Lines 64-

67, continuing to Column 5, Line 1, "in the Unix file system, every file has an associated

unique "inode" which indexes into an inode table. A directory entry for a filename will

include this inode index into the inode table where information about the file may be

stored."). Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to set a breakpoint in an UNIX environment, as suggested

by O'Connor, to use an inode to represent a file. The modification would have been

obvious because one of ordinary skill in the art would have been motivated to run the

software in different operating systems.

        Claim 16 is rejected under the same reason set forth in connection of the rejection

of claim 3.

        Claim 29 is rejected under the same reason set forth in connection of the rejection

of claim 3.

9.   Claims 4, 17 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Rosenberg in view of Sumi as applied in claim 1, 14 and 27 respectively, in further

view of Starek et al. (US Patent No 6,256,646) hereafter Starek..

Per Claim 4, Rosenberg disclosed file identifier is a file name. Neither Sumi nor

Rosenberg disclosed a **file control block**. However, Miller teached **file control block**.

(see Column 6, Lines 3-7, "for the **NT** file system (NTFS). In NTFS, all file and

directory information contained within an NTFS volume is tracked by the Master File

Table (MFT). The MFT is a linear list of <u>File Control Blocks</u> (FCB).") and (see Column

6, Lines 17-19, "NTFS stores directory information by creating additional index runs

that contain all of the <u>file names</u> or sub directory names that are in the directory.").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to set a breakpoint in NT environment, as suggested by Starek, to use

an file control block to represent a file. The modification would have been obvious

because one of ordinary skill in the art would have been motivated to run the software in

different operating systems.

Claim 17 is rejected under the same reason set forth in connection of the rejection

of claim 4.

Claim 30 is rejected under the same reason set forth in connection of the rejection

of claim 4.

10.   Claims 5, 9-13, 18, 22-26, 31 and 35-39 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Rosenberg in view of Sumi as applied in claim 1, 14 and 27

respectively, in further view of Rabinovici et al. (US Patent No 6,505,285) hereafter

Rabinovici.

        Per Claim 5, Rosenberg disclosed file identifier is a file name. Neither Sumi nor

Rosenberg disclosed a **virtual address**. However, Rabinovici teached *resolving a virtual

address of said code to said file identifier and said offset*. (see abstract, "The SEG

subsystem works with transient segments (also referred to as scratch segments) that are

created as **offsets** in a "well-known" **file** created during initialization of the PDE. The

offsets are stored in objects/elements in a queue in the virtual address space of the SEG

subsystem. Upon partitioning addressable memory into one or more scratch segments,

obtaining the **offsets** for the scratch segments, and **mapping** the offsets into the SEG

system's **virtual address** space, the physical memory is locked."). Therefore, it would

have been obvious to one of ordinary skill in the art at the time the invention was made to

map the file offset in a virtual address space, as suggested by Rabinovici, to find where

an object is located in a computer system. The modification would have been obvious

because one of ordinary skill in the art would have been motivated to access any address

of the whole computer system.

Claim 9 is an obvious variation of limitation step of claim 5 because it is just a reversed operation of the step perform therin. Hence, it would have also benn obvious using the same rationale as set forth in claim 5.

As per Claim 10, Rabinovici disclosed computer **operating system** (see Fig. 1, OS 110) and used file and offset with **memory mapping** to a virtual address.(see claim 5).

Claim 11 is rejected under the same reason set forth in connection of the rejection of claim 10.

Claim 12, Rabinovici disclosed

-*two or more virtual addresses exist.*(see abstract, "The offsets are stored in objects/elements in a queue in the virtual address **space** of the SEG subsystem.")

As per Claim 13, Rabinovici disclosed

-*a private-per-process copy of a physical page* (see Column 4, Lines 60-54, "A daemon 212 of the SEG subsystem 206 provides the mapping (the offset and size) in **its own** virtual address space and locks **the physical pages** behind the offsets so that the network 104 can perform direct memory access (DMA) operations.").

Claim 18 is rejected under the same reason set forth in connection of the rejection of claim 5.

Claim 22 is rejected under the same reason set forth in connection of the rejection of claim 9.

Claim 23 is rejected under the same reason set forth in connection of the rejection of claim 10.

Claim 24 is rejected under the same reason set forth in connection of the rejection of claim 11.

Claim 25 is rejected under the same reason set forth in connection of the rejection of claim 12.

Claim 26 is rejected under the same reason set forth in connection of the rejection of claim 13.

Claim 31 is rejected under the same reason set forth in connection of the rejection of claim 5.

Claim 35 is rejected under the same reason set forth in connection of the rejection of claim 9.

Claim 36 is rejected under the same reason set forth in connection of the rejection
of claim 10.

Claim 37 is rejected under the same reason set forth in connection of the rejection
of claim 11.

Claim 38 is rejected under the same reason set forth in connection of the rejection
of claim 12.

Claim 39 is rejected under the same reason set forth in connection of the rejection
of claim 13.

11.   Claims 7-8, 20-21 and 33-34 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Rosenberg in view of Sumi as applied in claim 1, 14 and 27

respectively, in further view of Murakami et al. (US Patent No 5,892,921) hereafter

Murakami.

As Per Claim 7, Rosenberg disclosed file identifier is a file name. Neither Sumi

nor Rosenberg disclosed a **hash list**. However, Murakami teached **a hash list to look up**

said global breakpoint using said file identifier and said offset. (see Column 16, Lines

34-38, "The **hash** queue holds in the form of a **list** the block information related to the

block in which the valid data is stored, for each hash value which uses the **file ID**

number and the in-file **offset** as keys."). Therefore, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to use file ID and offset as keys, as suggested by Murakami, to establish a hash queue. The modification would have been obvious because one of ordinary skill in the art would have been motivated to improve the buffer management.

As Per Claim 8, Murakami disclosed

-*maintaining hash list*(see Column16 Lines 32-34e buffer management module 23B2 **holds data structures** of hash queues, free lists and the like for managing the buffer 12 in blocks.").

Claim 20 is rejected under the same reason set forth in connection of the rejection of claim 7.

Claim 21 is rejected under the same reason set forth in connection of the rejection of claim 8.

Claim 33 is rejected under the same reason set forth in connection of the rejection of claim 7.

Claim 34 is rejected under the same reason set forth in connection of the rejection of claim 8.

Response to Arguments

12.   Applicant's arguments with respect to claims rejection have been considered but

are moot in view of the new grounds of rejection.

Furtheremore, in the remarks, the applicant argues that:

I)   As for claim 1, 14 and 27, that the file name is received "for an executable image

file" that "the executable image file is loaded in memory of a computer system for

execution by the computer system" and that the global breakpoint is to be placed in the

image."

Examiner's response:

I)   Examiner disagrees with applicant's assertion that Rosenberg's and Sumi doesn't

teach:

Rosenberg teaches executable image file (see Page 167, line 4) loaded in the

memory of computer system. Since it is a file, a file name is inherently possessed. Also in

the operating system, every file is unique and loaded in the memory of the computer

system. And it is easy to lookup a symbol expression and/or offset for a location in the

executable image file by looking up the symbol tables of the file. (Page 161-172, and

Algorithm 8.2-8.7).

Conclusion

13.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence Information

14.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuo-Liang J Tang whose telephone number is 703-305-4866. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on 703-305-4552.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9306.

Kuo-Liang J. Tang

Software Engineer Patent Examiner

TUAN DAM
SUPERVISORY PATENT EXAMINER